difference estimated value Tbd as a maximum peripheral block temperature difference estimated value Tmax.

FIG. 20 is a diagram showing an example of a temperature estimated value Tb, a peripheral block temperature difference estimated value Tbd, and a maximum peripheral block temperature difference estimated value Tmax which are estimated for each peripheral block.

As shown in FIG. 20(*a*), it is assumed that a temperature estimated value Tb is estimated for each peripheral block, as in FIG. 15(*a*). As shown in FIG. 20(*b*), a peripheral block temperature difference estimated value Tbd for each peripheral block is then found, as in FIG. 15(*b*). Finally, a peripheral block at the lower left corner having a maximum peripheral block temperature difference estimated value Tbd (13 in the example shown in FIG. 20) out of peripheral block temperature difference estimated values Tbd shown in FIG. 20(*b*) is selected, and 13 which is the peripheral block temperature difference estimated value Tbd for the peripheral block is taken as the maximum peripheral block temperature difference estimated value Tmax.

As a result, as shown in FIG. 20(C), the peripheral block temperature difference estimated values Tbd for all the peripheral blocks are replaced with the maximum peripheral block temperature difference estimated value Tmax. A multiplication factor k is determined, as in FIG. 8, for each peripheral block using the maximum peripheral block temperature difference estimated value Tmax, and the luminance of each of the peripheral blocks is controlled depending on the multiplication factor k.

A controller 3 uses the maximum peripheral block temperature difference estimated value Tmax found in the above-mentioned manner, to output a brightness control signal LC to a brightness controller 2 such that the luminance is controlled for each peripheral block. The brightness controller 2 outputs to a display 1 an address driver driving control signal AD, a scan driver driving control signal CS, and a sustain driver driving control signal US for controlling luminance for each peripheral block depending on the brightness control signal LC. In the display 1, the luminance is controlled in response to each of the inputted driving control signals.

The present embodiment is the same as the second embodiment except that a temperature difference estimator 4B corresponds to a temperature estimation circuit and an operation circuit.

In the plasma display device configured as described above, the luminance control method for each of the above-mentioned embodiments can be used, thereby making it possible to obtain the same effect.

In the present embodiment, the luminance is controlled using the maximum peripheral block temperature difference estimated value Tmax representing the largest temperature difference in the peripheral blocks, thereby making it possible to more reliably prevent the PDP 11 from being damaged. Further, the luminance is controlled by one maximum peripheral block temperature difference estimated value, so that processing for controlling the luminance is simplified.

Description is now made of a plasma display device according to a fourth embodiment of the present invention. FIG. 21 is a block diagram showing the configuration of the plasma display device according to the fourth embodiment of the present invention.

The plasma display device shown in FIG. 21 is the same as the plasma display device shown in FIG. 1 except that a temperature measuring unit 6 is added. Accordingly, the same portions are assigned the same reference numerals and hence, the description thereof is not repeated.

As shown in FIG. 21, the temperature measuring unit 6 is connected to a panel periphery temperature setter 5, and directly measures the temperature of the panel outer periphery of a PDP 11 and outputs the measured temperature to the panel periphery temperature setter 5. The panel periphery temperature setter 5 sets a reference value To corresponding to the measured temperature and outputs the set reference value To to a temperature difference estimator 4. After that, the subsequent processing is performed as in the first embodiment, so that luminance is controlled.

The present embodiment is the same as the first embodiment except that the panel periphery temperature setter 5 and the temperature measuring unit 6 correspond to a measurement circuit.

In the plasma display device configured as described above, the luminance control method in the first embodiment can be similarly used, thereby making it possible to obtain the same effect. When the temperature measuring unit 6 in the present embodiment is used for another embodiment, a luminance control method in another embodiment can be also similarly used, thereby making it possible to obtain the same effect.

In the present embodiment, the temperature of the panel outer periphery is directly measured, and the luminance can be controlled on the basis of the reference value To corresponding to the temperature. Even when the reference value To is changed due to the variation in outer air temperature, for example, therefore, the PDP 11 can be more reliably prevented from being damaged. The number of measuring points in the temperature measuring unit 6 may be one or plural in the panel outer periphery. When a plurality of points are measured, a reference value may be set for each of the measuring points, or a reference value may be set, for example, with respect to the average of the results of the measurement of the plurality of points.

Although in each of the above-mentioned embodiments, the video signal VS is multiplexed by the multiplication factor k included in the brightness control signal LC outputted from the controller 3 in the multiplication circuit 21 to control the luminance, the maximum luminance of an image displayed on the PDP 11 may be lowered by changing the multiplication circuit 21 into a limiting circuit for limiting the maximum luminance of the video signal, outputting an upper-limit value of the maximum luminance corresponding to the temperature difference estimated value from the controller 3, and limiting only luminance exceeding the upper-limit value of the maximum luminance by the limiting circuit.

What is claimed is:

1. A display device, comprising:

a display having a display screen including a plurality of regions, that displays an image with a luminance related to a video signal, and an outer peripheral portion adjacent to said display screen;

a temperature estimation device that estimates, from said video signal, a temperature value corresponding to a temperature of said display screen;

an operation device that determines a temperature difference estimation value in accordance with a reference value related to said temperature of said outer peripheral portion, and said temperature estimation value; and

a control device that extracts a peripheral region, from among said plurality of regions, that is adjacent to said outer peripheral portion, said control device lowering a

luminance level of said peripheral region as said temperature difference estimation value increases.

2. The display device of claim 1, wherein said reference value is selected from among a plurality of reference values that differ in accordance with a position of said outer peripheral portion of said display.

3. The display of claim 1, further comprising:

a measurement device that measures said temperature of said outer peripheral portion of said display, said measurement device outputting a reference value, corresponding to said measured temperature, to said operation device.

4. The display of claim 1, wherein said temperature estimation device estimates said temperature estimation value corresponding to said temperature of an outer periphery adjacent portion in said display screen adjacent to said outer peripheral portion.

5. The display of claim 1, wherein said display comprises:

a first board;

a second board; and

a plurality of light emitting elements that form said display screen which are interposed between said first board and said second board, an outer periphery of said first board being joined to an outer periphery of said second board, said outer peripheral portion of said display comprising a portion between certain light emitting elements positioned in an outermost periphery of said display screen and a joint portion of said first board and said second board.

6. The display of claim 1, wherein said temperature estimation device subtracts data corresponding to an amount of dissipated heat from an integrated data related to said luminance from said video signal to obtain said temperature estimation value.

7. The display device of claim 1, wherein said control device lowers a maximum luminance of said image as said temperature difference estimation value increases.

8. The display device of claim 1, wherein a gray scale of said image is selected from among a plurality of gray scales, said control device lowering said luminance of said image at a same ratio for each of said plurality of gray scales.

9. The display device of claim 1, wherein a gray scale of said image corresponds to said video signal in a plurality of light emitting formats which are the same in a total number of gray scales, but which differ in a number of light emitting pulses on each of said gray scales, said luminance of said image being controlled in accordance with a selected light emitting format, said light emitting format being selected based upon said temperature difference estimation value out of said plurality of light emitting formats.

10. A display device, comprising:

a display having a display screen including a plurality of regions that displays an image with a luminance related to a video signal, and an outer peripheral portion adjacent to said display screen;

a temperature estimation device that estimates, from said video signal, a temperature value corresponding to a temperature of said display screen;

an operation device that determines a temperature difference estimation value in accordance with a reference value related to said temperature of said outer peripheral portion, and said temperature estimation value; and

a control device that extracts a peripheral region, from among said plurality of regions, said control device setting a luminance level of said peripheral region to be lower than a luminance value of a block inside said display screen.

11. A display device, comprising:

a display having a display screen including a plurality of regions that displays an image with a luminance related to a video signal, and an outer peripheral portion adjacent to said display screen;

a region extraction device that extracts peripheral regions adjacent to said outer peripheral portion from said plurality of regions;

a temperature estimation device that estimates a temperature value, from said video signal, said temperature estimation value being related to a temperature of said display screen for each of said peripheral regions;

an operation device that determines a peripheral region temperature difference estimation value using a reference value that corresponds to a temperature of said outer peripheral portion and said temperature estimation value estimated for each of said peripheral regions; and

a controller that controls a luminance level for each of said peripheral regions in accordance with said peripheral region temperature difference estimation value.

12. A display device, comprising:

a display having a display screen including a plurality of regions that displays an image with a luminance related to a video signal, and an outer peripheral portion adjacent to said display screen;

a region extraction device that extracts peripheral regions adjacent to said outer peripheral portion from said plurality of regions;

a temperature estimation device that estimates a temperature value, from said video signal, said temperature estimation value being related to a temperature of said display screen for each of said peripheral regions;

an operation device that determines a peripheral region temperature difference estimation value for each of said peripheral regions from said estimated temperature value estimated for each of said peripheral regions, said operation device using a reference value that corresponds to a temperature of said outer peripheral portion and said temperature estimation value estimated for each of said peripheral regions, said operation device using a maximum peripheral region temperature difference estimation value to determine said peripheral region temperature difference estimation value; and

a controller that controls said luminance of said image in accordance with said maximum peripheral region temperature difference estimation value.

13. The display device of claim 12, wherein said controller controls said luminance for each of said peripheral regions such that an amount of controlled luminance between adjacent peripheral regions is smoothly changed in accordance with said peripheral region temperature difference estimation value.

14. A display device, comprising:

a display having a display screen including a plurality of

regions, that displays an image with a luminance related to a video signal, and an outer peripheral portion adjacent to said display screen;

a temperature estimation device that estimates, from said video signal, a temperature value corresponding to a temperature of said display screen;

an operation device that determines a temperature difference estimation value in accordance with a reference value related to said temperature of said outer peripheral portion, and said temperature estimation value; and

a control device that controls the luminance of the image based on the temperature difference estimation value.